predominate among all large groups of criminals. These are well set forth by Mr. Ellis, chiefly under the titles of cranial characteristics, physical insensibility, moral insensibility, and emotional instability. A fresh indication of frequent misshape in their heads may be derived from the three composite portraits of criminals (who were by no means of a bad order) that are given in this volume. Here the outlines of the heads of the composites are very hazy, testifying to large and *various* differences in the component portraits. These composites show no prevalence of any *special* deformity in head or features.

The hope of the criminal anthropologist is to increase the power of discriminating between the natural and accidental criminal. He aims at being able to say with well-founded confidence of certain men that it is impossible to make them safe members of a free society by any reasonable amount of discipline, instruction, and watchfulness, and that they must be locked up wholly out of the way. Also, to say of some others that it would be both cruel and unwise to treat them as ordinary criminals, because they have been victims of exceptional circumstances: they are not naturally unfit, and therefore still admit of being turned into useful members of society. Extracts are given in this book from the official reports of the prison at Elmira in the United States, where experiments are made in educating prisoners of the latter class. They describe a system of massages and Turkish baths three times a week, courses of literature, æsthetics, and ethics, including a study of Jowett's translation of the "Republic" of Plato, and of the works of Herbert Spencer, together with a gymnasium and a drum corps, suggesting to the unprepared reader a chapter in Gulliver's account of the institutions of Laputa.

FRANCIS GALTON.

ELEMENTARY PHYSIOGRAPHIC ASTRONOMY.

Lessons on Elementary Physiographic Astronomy. By John Mills. (London: Chapman and Hall, 1889.)

THE expressions of approval of the physiography syllabus of the Science and Art Department by the British Association Committee on science teaching lend an additional interest to new text-books of this subject. The book before us covers the portion of the syllabus dealing with the movements of the earth. We believe Mr. Mills has occasionally been employed as an Assistant Demonstrator at the Normal School of Science, and on the strength of this he claims to have had four years' experience as a teacher of the subject in that institution. It is rather late for Mr. Mills to state that, "in the hope of encouraging teachers and students to make the subject a more practical one, instructions have been given for making some inexpensive apparatus," considering that all the practical work given is taken from the book of instructions supplied to students at the Normal School, and which was distributed by the authorities of the Science and Art Department to teachers throughout the country some months ago, with the sole object of encouraging practical demonstrations in classes. Anyone can now obtain the same for twopence. There are many indications that the author is only acquainted with a limited part of the subject. The article on the use of the micrometer, for example (p. 25), is sure to impart the idea that a definite fraction of an inch represents a definite amount of arc, irrespective of the telescope employed; and that, in consequence, the distance between two stars or the apparent diameter of a planet can be stated in inches; further, the zero for position angles is given as "the normally horizontal wire," which is obviously an inconstant, and therefore useless one. Wrong impressions are also given as to the functions of the "Nautical Almanac," for p. 81 distinctly implies that it is a record of actual observations, whereas it is published three or four years in advance. Again, on p. 20, it is stated that the transit circle is made to read 90° when the telescope is pointing to the Pole, and therefore that "when the telescope is directed to any star crossing the meridian we obtain the north polar distance of the star, and this being known, we can easily determine its declination," which is neither clear nor correct.

After deducting the practical instructions, the most casual comparison with Prof. Norman Lockyer's "Movements of the Earth," will show the source of inspiration of the remainder, although there is not a word of acknowledgment. The head-lines, diagrams, and occasionally the language, remind one of that book. The order of things has certainly been slightly changed, but the only result is to introduce disconnections and anticipations. The micrometer, for example, is described before the chapter on angular measurements, and the chronograph precedes that on the measurement of time. The terms "right ascension" and "declination" are frequently used, although the explanation of them is reserved for the very last page. Further instances might be multiplied almost without limit.

The whole book is of a very sketchy character, and the only redeeming feature is the excellent series of diagrams.

A. F.

OUR BOOK SHELF.

Theoretical and Practical Treatise on the Strength of Beams and Columns. By Robert H. Cousins, Civil Engineer, formerly Assistant Professor of Mathematics at the Virginia Military Institute, Lexington, Va. (London and New York: E. and F. N. Spon, 1889.)

THE author of this treatise comes forward with an attempt at an explanation of the *paradox of the beam*, which is that a beam is about double as strong as theory makes out it should be, when the resistance of the beam to bending is calculated from the tension and pressure of the fibres, considered as acting independently and without lateral support.

To account for this discrepancy, which is well known to practical men, a paper by W. H. Barlow, in the Phil. Trans., 1855, proposed a theory of lateral support of the fibres to account for the extra strength, while his careful experiments showed that the neutral plane was certainly very close to the position which theory assigned to it. Previously it had been usual for practical men to place the neutral plane at the top or bottom of the beam, and thence to calculate the strength; a better agreement with theory being thus obtained.

The author of the present treatise adopts the more modern method of taking a different tenacity and modulus of elasticity of the material for extension and for compression; his calculations are principally directed to finding the breaking load of the beam; but as all the

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laws of elasticity break down long before breaking takes place, it is not surprising that he should find himself in disagreement with the results of theoretical elasticity.

A summary of the author's theory is given on p. 31, in the shape of ten hypotheses, most of which are of general acceptation, except perhaps number 8, which asserts that "The algebraic sum of the direct forces of compression and extension can never become zero;" while number 4 is redundant, and opposed to the principles of elementary statics.

After the length of time the theory of the beam has been worked at, it is natural to expect the treatment to have fallen into a conventional groove; but there is an unfamiliar appearance about the present pages, which makes it difficult to find out where the originality claimed by the author for his theory comes in; while many of his statements about the position of the neutral line (p. 27) "at the inception of the loading being at the bottom or extended side of the beam, and moved upwards by reason of the deflection and equally with it," are in direct opposition to the careful observations of Mr. W. H. Barlow.

A great many additional pages, reaching to number 166, are devoted to applications to beams of different materials, cast-iron, wrought-iron and steel, and timber; but the method is the same throughout, so that the essence of the book would go into very few pages. The treatise is a great contrast in this respect to most recent American publications on practical subjects.

A. G. G.

Chambers's Encyclopædia. New Edition. Vol. V. (London and Edinburgh: W. and R. Chambers, 1890.)

THE new volume of the present edition of "Chambers's Encyclopædia" deserves in all respects as cordial a reception as that which has been given to the preceding volumes. The editor has done his work with admirable care, selecting for the various subjects writers competent to deal with them, and setting apart for each subject, as nearly as possible, the space that properly belongs to it in accordance with the scheme of the work as a whole. Of the strictly scientific contributions, we need only say that those of them we have been able to examine are sound and concise. With regard to the articles on geology and heat, it may be enough to mention that the latter is by Prof. Tait, the former by Prof. James Geikie, to whom also have been intrusted the articles on the Glacial period and the geology of Great Britain. The climate of Great Britain is the subject of a short but luminous paper by Dr. Buchan. An excellent account of gas and gas-lighting is given by Dr. Alfred Daniell, and Prof. Ewing describes the gas-engine. Mr. Keltie contributes an interesting paper on geography, and Dr. J. S. Mackay writes with his usual clearness on geometry. Mr. F. Hindes Groome's article on the gypsies may be noted as a capital summary of many curious facts and theories. Mr. J. Arthur Thomson, in his article on heredity, displays wide reading and an impartial judgment; and Dr. J. Anderson's article on hill-forts shows how much solid information may be packed into a small space by a writer who knows his subject thoroughly.

Essays of an Americanist. By Daniel G. Brinton, M.D. (Philadelphia: Porter and Coates, 1890.)

MOST of the papers in this volume have already been printed, but some have been substantially re-written, and each of them derives an added value from the fact that it appears in association with other essays on kindred subjects. Dr. Brinton classifies the various papers under the four headings, "ethnologic and archæologic," "mythology and folk-lore," "graphic systems and literature," and "linguistic." To those who are familiar with his contributions to ethnology and anthropology we need scarcely say that the volume sets forth the results of much fresh thought and solid work. In some respects the conclusions at which Dr. Brinton has arrived differ widely from those of most other anthropologists. He holds, for example, what he calls "the specific distinction of an American race," and "the generic similarity of its languages." He is also persuaded that the tribes of this race "possessed considerable poetic feeling," and maintains "the absolute autochthony of their culture." These and other positions he defends with much ingenuity, and even those readers whom he may fail to convince will find that it is worth while to master his arguments. As an example of the thorough way in which he works at his subject, we may note his chapter on the Toltecs, whose far-famed empire he describes as "a baseless fable."

Esquisse Historique sur la Marche du Développement de la Géométrie du Triangle. By E. Vigarié. (Association Française pour l'Avancement des Sciences—Congrès de Paris, 1889.)

THIS is a full and carefully drawn-up sketch of what is sometimes called the modern geometry of the triangle. It carries on the bibliographical notice contributed by M. E. Lemoine to the same Association (1885) up to the present time, and supplies some of the lacunæ in that notice. The author appears to be very fair towards foreign mathematicians, and any deficiencies in noticing English contributions are due to there being at present no account of results which may be buried in such journals as the *Mathematician*, the *Lady's and Gentleman's Diary*, and similar works. We have little doubt that an examination of these would lead to the unearthing of many anticipations of recently obtained results.

LETTERS TO THE EDITOR.

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A Uniform System of Russian Transliteration.

IN NATURE, vol. xli. pp. 396–97, which has only now reached Tashkend, there is a very interesting note under the above title. It is stated that "the recommended system will be adopted without delay." How is this to be understood? Does it mean that the system is finally settled? It would be a pity if this were so, because the proposed method of transliteration contains a point which would be a source of perplexing difficulties when used in practice.

The suppression of the semi-vowels ъ and ь (hard and soft pronunciation) at the ends of words, would make many of them indistinguishable. For instance, with the proposed system, the words

	пыль (dust)	would be	= *puil*
and	пылъ (heat)	,,	= *puil*
	билъ (did heat)	,,	= *bil*
and	биль (a bill)	,,	= *bil*
	яръ (precipice)	,,	= *yar*
and	ярь (verdigris)	,,	= *yar*
	данъ (given)	,,	= *dan*
and	дань (tribute)	,,	= *dan*

and so on.

The differences of these sounds exist for some purpose in the Russian language, and they ought to be rendered in some way in the transliteration. Perhaps the simplest plan would be to adopt the Polish method of denoting the soft pronunciation with an *accent* above the letter in question. The words just given would then be written *dan* and *dań*, *yar* and *yaŕ*, &c.

I may be allowed to make some further suggestions. They are of minor importance, but would tend to improve, in my opinion, the proposed system.

Would it not be more convenient to transliterate the Russian ы with *y*, as is done in the Polish language? The proposed symbol *ui* does not even remotely represent the right sound, and

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